Printed Pages :3

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NBC103

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 294103

Roll No.

MCA (Dual Degree) (Semester-I)

SPL. THEORY EXAMINATION, 2014-15

DIGITAL ELECTRONICS

Time : 3 Hours] *[Total Marks : 100*

Note : Attempt all questions. Each question carry equal marks.

1. Attempt any four questions.

   A. Convert the hexadecimal number 68BE to binary, and then convert it from binary to octal.

   B. Convert decimal 27.315 to binary.

   C. Determine the value of base x if $(211)x = (152)_8$.

   D. Determine the 10's complement of $(935)_{11}$.

   E. Discuss gray code with example.

   F. Perform subtraction on binary numbers using 2's complement method : 1001 – 101000.

2. Attempt any four questions.

A. Demonstrate the validity of The associative law: $x + (y + z) = (x + y) + z$ by means of truth table.

B. Simplify the Boolean expression x'yz + xz to a minimum number of literals.

C. Implement the Boolean function F = xy + x'y' + y'z a) with AND. OR, and inverter gates. b) with OR and inverter gates, c) with AND and inverter gates.

D. Express the following function as a sum of minters and as a product of maxterms: $F(A, B.C. D) = B'D + A'D + BD.$

E. Show that the dual of the exclusive-OR is equal to its complement.

F. Prove (x')' = x.

3. Attempt any two questions.

A. Simplify the Boolean function F(w,x,y,z) = $\sum$(1,4,5,6,12,14,15) using four variable map.

B. Simplify the followlng Boolean function *F* together with the don't -care conditions *d*, and then express the simplified function in sum-of-minterms form :

F(x,y,z) = $\sum$(2,3,4,6,7)

d(x,y,z) = $\sum$(0,1,5)

C. Simplify the Boolean function F(A,B,C,D) = $\sum$(0,2,4,5,6,7,8,10,13,15) using tabulation method.

4. Attempt any two questions.

A. Show that a full adder can be constructed from two half adders and an OR gate.

B. Design a circuit that covert a 3-bit gray code to binary code.

C. What do you mean by decoder? Implement full adder by decoder.

5. Attempt any two questions.

A. What do you mean by flip-flop? Discuss SR flip-flop in detail.

B. What do you mean by shift registers? Explain Bi-directional shift register.

C. What do you mean by counters? Discuss 3-bit binary ripple counter.

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